

Welcome to the UTSA

MARC ▶

U\*STAR ▶

Maximizing Access to Research Careers  
Undergraduate Student Training for Academic Research  
BIO | BME | CHE | MAT | PHY | PSY



Research Training Program



Rev. 04/23/2015

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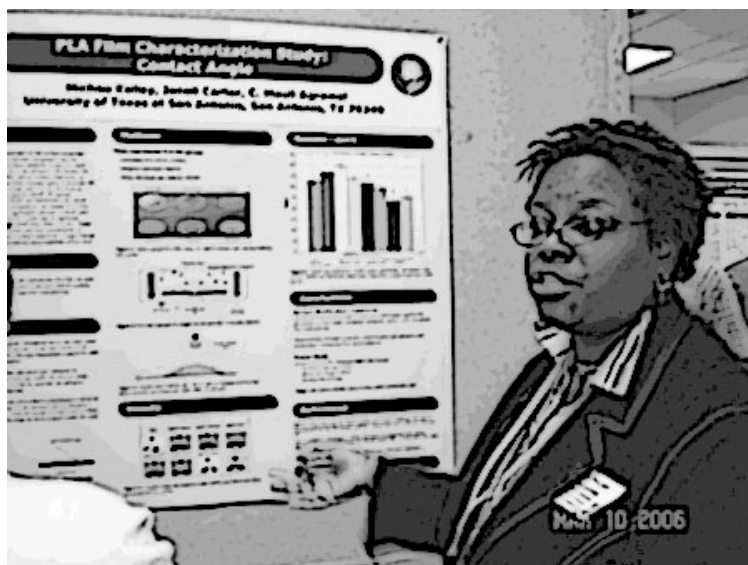
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### **Program Evaluator**

Mr. Curt Steuck

**Program Web Site:** <http://www.utsa.edu/marc/>

**Research Mentors:** Brief descriptions of research foci for program mentors are listed on the program web site. You may also make arrangements with Dr. Taylor to explore addition researchers from participating departments, as long as they are conducting biomedical or behavioral research, have sufficient research funding, and are willing to fill out the required mentor application. Please note that the presence of a mentor on the list does not mean that they have space or money to support a MARC trainee; you will need to make an appointment and speak to them.



## What is MARC U\*STAR?

MARC U\*STAR is a Pre-PhD research training program supported by the Training, Workforce Development & Diversity component of the National Institute of General Medical Sciences of the National Institutes of Health <http://www.nigms.nih.gov/Training/>. MARC was created because of federal recognition of the importance of promoting diversity in the biomedical and behavioral sciences. The goal of the MARC U\*STAR



(Maximizing Access to Research Careers Undergraduate Student Training in Academic Research) program is to provide a solid foundation for disadvantaged or underrepresented students who have made a firm commitment to entering doctoral training. The UTSA MARC program funds undergraduate Juniors and Seniors to work in research laboratories at UTSA and, occasionally, at the UT Health Science Center.

MARC activities are designed to ensure that participants develop skills and the academic foundations needed to enter and succeed in doctoral programs. MARC undergraduates move beyond traditional coursework where laboratory experiments have known and reliable outcomes and perform original scientific research in collaboration with a faculty mentor. They are involved in the design of their experiments and experience both the exhilaration of an important result and the frustration of unexpected technical problems and failures. They are expected to become intimately knowledgeable about their experiments and to create a thesis as a capstone project of their experience.

Many first generation or disadvantaged students do not have the family or social network that can properly understand and encourage them onwards to a doctorate; the program hopes to build a local support system to help them to do so. In addition, the MARC program helps students to build both a local and national network of peers and professional contacts.

Other benefits of the MARC program are partial tuition support and funding to attend one scientific meeting per year. Courses are required that will be necessary for most graduate programs. In addition, students have free access to the MBRS/MARC computer laboratory and classroom, both for study and for printing wide format scientific posters. The program will match you with other students for tutoring or provide funding for group tutoring, as needed. The program also is the sponsor of the MBRS-RISE/MARC-U\*STAR/WSRTP Friday seminar and workshop series, which broadens your professional training and introduces you to role model scientists, often from alternative career paths. Finally, our trainees expected to expand their laboratory knowledge by attending off-campus summer undergraduate research programs at leading universities around the country. Welcome to the program! We strive for your success! 🌀

# Finding a Research Mentor

Participants in the MARC U\*STAR program perform research under the supervision of one of the pre-approved UTSA research faculty. This article is designed to help you to make your choice of whom to work with. The right research mentor can greatly enhance your experience and further your excitement and preparation for a research career. The wrong one could give you second thoughts about a career that you might have otherwise enjoyed. Below, we provide information on how to choose a compatible mentor for your research.



*You will select your mentor from a group of tenure-track faculty who should do the following, or make sure that a trusted associate does so:*

- Assist you in developing a reasonably sized research project
- Help you get started with your project and assure that you make progress
- Coordinate your training in research techniques
- Provide supplies and laboratory space
- Help you troubleshoot research problems
- Give you encouragement and feedback about your progress
- Show you what life as an academic scientist is really like
- Help you to develop critical thinking and a scientific mindset
- Help you in researching a good graduate school
- Assist you in building a professional network of contacts

Regarding laboratory entry- You may immediately enter someone's lab, or you may take a few weeks to rotate through several labs to get a feeling for them. On the MARC U\*STAR (<http://www.utsa.edu/marc/>) web page, you will find a list of participating faculty members and often a brief description of their research interests. Their description will be linked to a more extensive description of their research interests and a description of projects currently being explored in their laboratories. Provide a list of at least five researchers whom you find interesting to Dr. Taylor; she make recommendations, and may also suggest additional faculty members with whom you may be compatible.

You will then email these individuals and set up meetings. You should prepare for these meetings by looking up their recent journal articles on Google Scholar or Pubmed (<http://www.pubmed.org>) or use other internet resources to find publications and laboratory websites prior to visiting. Your effort to do so will generally result in the researcher looking



favorably on you; you will be indicating a high level of motivation. Although you will likely find their publications difficult to understand at this point, you should at least be able to get a basic idea of the research that they do. Looking up their publications has the added benefit of letting you know if the person's laboratory is actively publishing, which increases your chance of authorship, which is desirable for doctoral program admittance.

Because many of the faculty members are locked behind security doors, we recommend that your first contact come email. If the potential mentor does not immediately respond, they may be buried in work; contact them again after a week or so. When you reach the potential mentor, identify that you have been admitted to the RISE program and either set up an appointment to speak to them face to face, or continue to interact with them via email/phone if they wish.

A good contact email can go as follows: "Dear Dr. XXXXX. I am an undergraduate Sophomore/Junior/Senior (pick one) XXX major and was recently admitted to the MBRS-RISE program. I am looking for a lab in which to work. and am very interested in your research on \_\_\_\_\_. , . If you accepting students at this time, I would like to schedule a meeting with you to discuss your research and possible opportunities in your lab." As a MARC trainee, I am required to participate in at least two two-week rotations, but after this I will be in a lab for \_\_\_ length of time until graduation. Thank you, \_\_\_\_\_ >



Establishing a successful working relationship with your mentor requires openness and honesty. The faculty member will have questions for you to judge your level of motivation and enthusiasm and to determine your interests in their research field. They will ask you about your academic background and grades, prior research experiences, research interests, time availability, and future goals. Be prepared to explain what you hope to get out of a research experience, why you are interested in this mentor's research and what general type of project you are interested in. It is advised that you bring a one-page "Bio" or CV, containing your contact information and summarizing any research experience that you may already have. A template for a CV is located at <http://www.utsa.edu/mbrs/resources.htm>.

In turn, ask the mentor to describe the research projects going on in his/her labs and which projects you might be able to get involved in. You should also inquire about what techniques you would be learning, who would be your primary trainer, and with whom would you be working. Is your schedule compatible with that of the person whom you will be assigned to work with? What type of time commitment do they expect? Assess for yourself if the mentor's communication style is compatible with yours. Is he/she high or low stress? Does the mentor seem interested in you as a person and make time for you?

While rotating in the lab, will also be able to speak with other laboratory members and find out more about the lab. How many hours do students generally work (this varies greatly between laboratories and you may not look good if you work significantly fewer)? Is it a quiet, serious laboratory, or loud and noisy? Is it a messy lab or extremely organized? Do the students like each other and “hang out” with one another after hours? Do you “click” with the person with whom you will be working? All of these things should be taken into consideration when assessing your compatibility.

After your meeting, thank the person for their time and information without making a commitment, complete the rest of your interviews, and get back to them as soon as possible. If you fear that this particular mentor or the laboratory and you are not a good match, pay attention to these feelings and interview additional potential mentors. Before you leave, make sure that the faculty member knows how to get in touch with you! In cases where you know that your research interests don’t align, ask this person if he or she knows of a faculty member with whom you may have more compatible interests or who is looking for students like you.

After careful consideration after your rotations, if you feel that the mentor/research project is right for you, ask whether the researcher will agree to be your mentor and allow you to work on the project you have discussed. Or, ask whether they will be willing for you to do a short rotation through the laboratory, to get a better “feel” about the laboratory environment. Be aware that the mentor, also, may wish to hold off and do some inquiring of his/her own. Also, remember to thank those whom you do not choose!



If you are turned down for a research project, don’t take it personally as there are many reasons why a faculty member may deny your request: the current research projects may be different than the projects listed, he/she may be insanely busy or already have the maximum number of students that can successfully be mentored, etc.

Continue to meet with faculty members or perform rotations until you have found a mentor with whom you have a good rapport, who will give you a research project that interests you. Tell this person that you’d like to work in his/her laboratory and have them write an email to the RISE and MARC Program office ([gail.taylor@utsa.edu](mailto:gail.taylor@utsa.edu)) to that effect. **If you are having trouble finding a laboratory, do not hesitate to talk to Dr. Taylor or Dr. Barea- they will help you out!**

Finally, if you are in a laboratory but find over time that you are having problems or not enjoying your research, please come and talk to Dr. Taylor. The RISE program is designed to be a positive experience, and if it’s not turning out that way, please allow us to help you figure out how to improve things!

**Good luck!** 🐾

# Starting Life in the Laboratory

A research laboratory can be one of the most exciting places that a person can work. You get to discover things never before known. You are contributing to science and to human progress. You get to dress casually and, often, have flexible hours (though at times, they can be dictated by your experiments or experimental subjects).



## Who is in the lab:

The Principal Investigator (P.I.) who is usually your mentor, owns the lab and generally spends a lot of time writing grants and intellectually guiding the activities of the lab.

*Postdocs* have their Ph.D. and are receiving additional training for anywhere from 2 to 5 years, prior to looking for a position as a PI or industry researcher. They tend to be somewhat independent. A new postdoc often has to learn a whole new field of literature and new equipment.

*Technicians* have varying levels of education, and are involved in the care of the lab. They order supplies, perform experiments (independently or as an assistant). Treat them with respect, as a trained technician can be the most skilled and experienced person in the lab and you do not want them annoyed with you. Do not expect them to do things for you personally, unless they have been assigned by the P.I. to do so.

*Graduate students* are either in the laboratory permanently or may be doing a rotation, which allows them to “try out” several labs prior to picking one in which to complete their research.

*Undergraduate students* may be in the lab as volunteers, for independent study classes, for honors theses, or as members of research training programs.

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## Rules to Live By:

Laboratories have many unspoken rules that you will need to pick up to be considered a well-behaved laboratory citizen. A number of these are compiled below:

### Things to do:

- ✓ Sit down with the PI and get the specifics of what is expected of you. Be happy if you are assigned to work with someone; you will get much more help than otherwise and you can worry about independent projects later.
- ✓ Finish your online safety training; you can't work without it!
- ✓ Familiarize yourself with who does what, when, in the lab. Learn by observation when possible, or ask when people are free (not in the middle of a complicated experiment). Or set up an appointment for them to go over material with you.





- ✓ Take notes on everything that is told to you. Do not make people explain things twice. Record people's names, incubation times and temperatures, locations of reagents, instructions, etc.
- ✓ Read the literature that is pertinent to your project. If it does not make sense, it will begin to once you are doing experiments. If your PI gave you something to read, read it as soon as possible. It can serve as a test of your commitment! If they ask you about it in a few days and you have not read it, it looks bad for you.
- ✓ Begin to complete any Animal care training necessary. See if you can be given a small non-animal project while working through this (It takes a long time).
- ✓ Try to do a simple experiment as soon as possible, even before you know exactly what you are doing. It will help you to understand what you are doing.
- ✓ Introduce yourself to everyone and ask them about their projects. Try to go out to lunch (network/bond) with people at least once a week. Participate in tea and coffee breaks.
- ✓ Although many people may pick their hours, there is a standard time commitment that is expected- do not violate this.
- ✓ If there is a general time trend when most people work, try to work at these same hours, at least at the beginning; this way, you will get to know people, obtain assistance, and assure folks that you are in the lab working hard. If you have to work alternate hours, then make sure that it's known what yours are and what you are doing.
- ✓ You will be assigned a desk or lab bench space. Arrange it however you like but keep it neat because other people may need to be using it too.
- ✓ You are likely to be assigned freezer and refrigerator space (might take a little while). Be respectful of other people's space and put your stuff where it belongs. If you put your stuff in someone's space thinking that you will remove it "in a sec," you will either forget to or get caught.
- ✓ If you mess it up, clean it up after (or during) each experiment. Cleanup is part of the experiment. It is NOBODY'S job to pick up after you in the lab. Even if the PI or other students are sloppy, this does not mean that you are allowed to be sloppy too.
- ✓ Try not to have an experiment fail or break equipment because you didn't ask a question. Do not repeat a failed experiment without asking someone more experienced what might have gone wrong, after brainstorming first on your own. Absolutely, be able to give suggestions on what might have gone wrong, so that you don't look helpless.
- ✓ If you break something, admit it and apologize. They will figure it out anyway, and if you lie about this, they will question your ability to do honest research. Offer to remedy the mistake, if possible.
- ✓ Use consumables (chemicals/reagents/buffers, etc) if and only if you have permission to do so. If you use it up (or nearly up), remake it or make sure that it's ordered.
- ✓ Put things back where you found them. Particularly pipettors or small movable pieces of equipment. Not just on the same shelf, but in the same position, particularly when solutions/reagents are involved.



- ✓ If there's an alarm, investigate it. You're part of the lab and lab problems are your responsibility. If you don't know about the alarm, ask someone (don't just shut it off and ignore it, either!).
- ✓ If lab equipment (such as ultra-centrifuges) has a sign-up sheet, sign-up to use it well in advance. Do not use it if someone has already signed up for that time slot!

### **Things Not To Do:**

- ✓ If you have trouble with anybody in the lab, do NOT stop going or drop out of the program. Communication is the key. Talk to your mentor. Talk to Dr. Taylor. Worst case scenario, we'll allow you to change labs.
- ✓ Don't demand someone's time, "Right now!" Set up appointments for someone to assist you, on their own time.
- ✓ Never demand that anybody in the lab teach you something, clean anything for you, or complete your experiments if you have to leave for the day. Ask and then generously pay people back with favors. Don't ask for favors too often, or without repayment.
- ✓ Don't use someone's buffers, reagents, or pipettors without their permission. They may be sterile and require special handling...or even bad. And, if you use someone's solutions without their permission, eventually they may make SURE that they are bad...
- ✓ Don't complain about how much office/bench space you are given. It can be resolved over time.
- ✓ Never complain (or even note) that "they didn't do it this way at...." if you've had other research experience. Wait and assess the why/how underlying this laboratory's practices. If you have a method that can actually improve circumstances, then let someone know...but not early on.
- ✓ Don't read a newspaper, novel or play computer games in the lab. Although there is dead time, read the scientific literature instead. Do otherwise and you will look bad.
- ✓ Don't ask or complain about money or salaries.
- ✓ Don't discuss someone else's results with anyone outside the lab.
- ✓ If you have an exciting result, don't broadcast it to the world outside of your own lab without asking your mentor if you can. Getting scooped is a very real possibility and you don't want this to happen.



### **Other Things to Find out About:**

**Dress Codes:** These are generally more relaxed at universities than in industry or hospitals. If you are at the Health Science Center, check out what people are wearing in the lab and dress similarly.

Remember that:

- The more expensive your clothing, the more likely it is that you will spill clothing chemicals on them.
- Ties can be dangerous if you are using fire.
- Open-toed shoes mean that when (not IF) you drip something, gravity works and you are likely to minimally get your feet splattered.

**Assigned Jobs-** Often there are common jobs in the lab that people are assigned to do. Take them seriously and don't complain.

**Meetings-** Your laboratory will likely have weekly meetings, to discuss experimental progress. These are generally informal and involve sharing research results and discussion. Find out where and when they are. Also, your mentor may require you to enroll in a special course or two.

**Chemicals-** how are they arranged, who makes solutions, bottle marking conventions, how to get a good pH, conventions on weighing (extra back into bottle, another bottle, or trash?).

**Computer-** is there one for you to share use on in the lab? Can you do literature searches on it? Are there computer use policies?

**Glassware-** Where is it? Where does the dirty glassware go? Will you have to wash your own? Is there a special washing procedure for certain glassware?

**Lab coats-** Do you need one? Is one provided? Who washes it?

**Lab notebook-** Is the lab book provided? Are books, duplicate books, or loose leaf sheets preferred? Is there a format that is required in this lab? Are there other conventions that are followed? Do you need to make a copy of all data?



**Supplies-** Who does the ordering? What do you do when you are running low? Is there a strict budget? Who picks up the supplies? Where do you put items that come in, that may need refrigeration or freezing?

**Photocopying-** Is there a machine in the lab? Is there a copy card that you can use? Are you limited on the number that you can make? Are there policies about what you can copy?

**Telephone calls-** Try to minimize the number of phone calls, texts, or Facebook check-ins. Folks in your lab will begin to resent hearing you gab endlessly with your friends, or cell phone notifications.

**Trash disposal-** What is biohazard and what is not? Who takes away the trash? Where do sharps (needles, etc) go? Where does glass go? Recyclables? Who autoclaves that which must be autoclaved?

**Vacations-** Find out when people take vacations. If you are in a lab, you are expected to work during days that are generally holidays for students, i.e., between semesters and during the summer. If you are going to take days off, clear it with your advisor and make sure that you've arranged to have someone take care of any ongoing duties (like feeding cell lines). Your advisor, rather than RISE staff, determines when it's okay for you to be gone on vacation, and will generally sign time cards even when you are gone. Try not to be gone too much, though.

**In conclusion,** the research laboratory can be an exciting and rewarding place to work. If you follow these rules, you are likely to start out on the right foot in the laboratory, be able to work cooperatively with others in the lab, and proceed nicely on your research.

Summarized and modified from: [At the Bench: A Laboratory Navigator](#) -- by Kathy Barker. Cold Spring Harbor Laboratory Press. 1998. – I highly recommend this book (GT)



## MARC Time Requirements

**MARC Trainees are expected to keep Fridays from 11 AM – 1 PM free for program seminars, lunch with the speaker and PD meetings.** If you enroll mid-semester, use your pre-enrollment privileges to avoid these times in your next semester. Other required activities will be announced.

### How much do I get paid...and what are my hours?

*Answer: MARC Trainees need to work at least 15 during the semester and 40 in the summer, but must not go far over this, as it could damage their grades. However, keep in mind that this is a research training program and not a job, so hours can vary a bit; keep in mind that it's a training program, not a job!*



In the MARC-U\*STAR program you are given a monthly stipend of \$1003/mo to support you while you complete your research. In the Spring and Fall semesters (not Summer), you receive a tuition benefit in Spring and Fall semesters. Additionally, you will receive financial support of approximately \$1250 to attend a scientific conference. Finally, while you attend summer programs, you will receive \$3000 for room and board, plus your normal monthly stipend. In return, it is expected that you will NOT hold outside employment, but focus on completing research projects.

It is expected that during the Fall and Spring semesters, you will devote *at least* 15 hours per week to your laboratory performing research; you should be physically present there during this time. You and your mentor can put together a schedule each semester and you should do your best to stick with it. Please remember that you are responsible for your own experiments- if you begin an experiment on a certain day, you will need to stay long enough to get your experiment done- there should be no: “My hours are done, you stop my gel...” You should also plan well enough that you do NOT have to disappear during midterms or finals to study; the laboratory is a commitment that you must honor. *If you do need to miss time in the laboratory, make sure to notify your mentor in person.* Keep in mind- your letters of recommendation are as important as the research experience you obtain!

The time that you need to spend in the laboratory may, at times, exceed your 15 hours, particularly when you are putting together scientific posters. We do with to emphasize, that you must maintain a healthy balance between your schoolwork and laboratory work; **do NOT kill your grades because you have become completely absorbed with the lab.** If you find yourself being given more and more “jobs” in the lab, this is beyond what we expect; you’re an undergraduate and need to study!! If you run into this circumstance, please talk to Dr. Taylor. Also, your thesis should be of a manageable size with modest proposals that you can complete in a semester or two while taking a full-time course load; you are not in a doctoral program. As a graduate student and beyond, you will need to plan carefully and multitask your responsibilities- now is a good time to begin, but you should carefully guard your grades.

During the **summer**, you are expected to put in a full time, 40+ hour, week

in the laboratory. At most, you should take one evening and one weekend course. Do NOT take courses such as Organic Chemistry at all, or any difficult courses over 5 weeks. For one Summer, you are required to attend an off-campus (and preferably out-of-city) Summer Research Program.

Overall...it is important to remember that the devotion that you put into your laboratory work and building your credentials (including courses) is directly related to what you will get out of the program! 🌀

### *For How Long am I Funded?*

Your appointment to the MARC-U\*STAR program is for two years, no more, no less. With few exceptions, students will be accepted into the program in June, but trainees are sometimes accepted at alternative times. You will work until the beginning of the semester nearest the date that you started. You will be evaluated each semester by yourself, your mentor, and program staff; if you are making progress, maintaining a strong GPA (not obtaining C's or lower), devoting yourself to your project, and have a continued commitment to apply for doctoral training, you will remain in the MARC program for the full time of your appointment. Summer(s) spent at a summer research program are counted towards time in MARC program. 🌀

### *MARC U\*STAR Thesis and College Honors*

**All MARC students are required for complete a MARC Thesis and to graduate with honors from their College (COS or COE) or Department (Psych), as well as from the Honors College, if possible.**



The thesis/write requirement for MARC and the other types of Honors will be formatted nearly identically to that required by the Honors college. If you are in the Honors college, you do NOT need to complete a second thesis, but just need to have a second face page with a place for the MARC Program Director to sign. The MARC Thesis Handbook is now online! <http://www.utsa.edu/marc/thesis.htm>. Briefly, as soon as you enter your laboratory, be working with your research mentor to come up with a good thesis project. In your final semester in MARC (even if you will not yet be graduating), you will complete your thesis and present a 15 minute oral presentation at the End of Semester Gathering to Honor Graduates. You will also be enrolling in two semesters of Honors research through your department, for which you will receive upper division credit. Make sure to go to the COS or COE to sign up to receive Honors credit. They prefer that students take the Honors research courses your final two semesters prior to graduation, but this can be waived if need be. When you finish your thesis, if you have maintained an adequate GPA, you will also obtain College of Science Honors (3.0 minimum) or College of Engineering Honors (3.3 minimum), if you submit the thesis as required. We are looking into COEHD honors. Make sure to visit your college and find out more about Honors (note...this is separate from the Honors College honors). 🌀

## Communications Technology Classroom and Laboratory

The RISE program has developed the Communications Technology Laboratory, in BSB 2.03.10, to benefit our student participants and their mentors. It features state-of-the-art presentation creation hardware and software, as well as a variety of printers (B&W, Color, Poster). Student researchers are welcome to use this laboratory for school work, meetings, practicing presentations, etc. All RISE students have printing privileges, as long as they are not abused.



Please be polite when in the lab...don't talk unnecessarily or chat on your phone. Normal working hours in the "Techlab" are 8:00 – 5:00, M – F. If you are in there after hours, you MUST call the police upon entry and exit, at x4242. As a RISE student, you have priority in the lab space- if you need to practice presentations or have a loud activity, you are allowed to do so. The only exception is when we loan out the room for PhD students to complete qualifying exams, or we allow a computationally-based course to meet there.

When you start up in the program, you will be given access to this room; if you ever have trouble getting in please let the program coordinator know. Program approval is needed for all poster printing. ☺

### Preferential Enrollment:

The MARC program has the ability to pre-enroll students in courses that are not controlled directly by the departments. With pre-enrollment, you can control when your courses will be held, assure that you can attend the Seminar, and optimize your time in the laboratory. We will send out a pre-enrollment form approximately a week prior to its due date; please return it ASAP to assure that you are pre-enrolled. We fully expect MARC trainees to take advantage of this and not miss MARC activities because you did not get your choice of section for particular courses. ☺

## Program Requirements

### Coursework:

#### All MARC Trainees must take:

- Biology I or Biology for Non Majors: An introduction to the science of biology, emphasizing basic cellular principles. Topics include biochemistry, cell biology, metabolism, molecular biology, and genetics.
- Two semesters (6 credits) of Honors Research for credit for performing research in their major.
- BIO 4953: “Research Careers & Professional Skills Development” (1 semester of a 3 credit course)
- 1 course of upper division coursework pertinent to their laboratory topic or graduate school interest.

#### In addition, the following courses will be required for trainees enrolled in the following majors:

- *We would prefer that all students would take Statistics, as well as at least one graduate level course.*

*We believe that these additional courses will enhance MARC U\*STAR student preparation for doctoral programs in the biological, chemical, or biologically-oriented computational sciences, without creating an overwhelming burden on students who are already carrying a heavy course load. Most, if not all, of these courses, will be counted towards the individual student’s degree program.*

#### Seminars and Friday Workshops:

All MARC students will attend the MBRS/MARC Seminar and Lunch with the speaker. The seminar meets from 11 – 12 Friday, and is followed by a one-hour lunch with the speaker.

**Miscellaneous Workshops:** All MARC students are required to go through a mock interview session with two UTSA faculty members during the year they graduate. This serves as a learning experience for future doctoral degree entrance interviews. 🌀

#### Enrollment in Restricted Courses:

The RISE/MARC Research Careers (BIO 4953) is a restricted course. Ask about enrollment in these courses. For the Departmental Honors research courses, you will have to fill out paperwork at the various departmental offices.

Departmental contacts are found here:

<http://www.utsa.edu/sciences/ugresearch/honors.html> 🌀

## Publications: - Scientific Papers and Abstracts

During your time as a MARC student, you are likely to publish research abstracts (paragraph summary of your research), give poster presentations (visual summary of your research), or even be an author on scientific journal articles (Publications! Yay! Great for your career!).



Please work with your research mentor to create the abstract, keeping the rules for the particular conference in mind, while creating the abstract. If it's an older abstract submitted elsewhere, you must 1) Ask your lab PI if you can submit it to the current activity and 2) give him or her a final review of what you want to submit before submitting it. This is particularly true of summer mentors, so you need to start working with them well before the submission deadline! In addition, for ABRCMS or SACNAS, you will need to show to Dr. Taylor. NOTE: Abstract writing is amazingly slow, considering how small an abstract is...but it gets easier with time!

When you write a scientific paper, it's often the mentor who does all of the writing. However, if it's a project for which you've done most of the work, discuss with your mentor the possibility of you doing the actual writing. This is great experience!

On any of these publications, it's common practice to acknowledge programs or grants that have funded you. The MARC U\*STAR number is: GM007717; it must be used on all publications where you are an author. When you complete any of these publications, please provide a copy to our program coordinator in the MARC office, so that we can put it in your file and include it in our annual report! ☞

## Maintaining Good Standing:

MARC students are placed on program probation 1) if they receive C's or below in a course or courses or are performing at a substandard level in their labs. If you find that you're having trouble in a course, please come and see Dr. Taylor ASAP, before the situation becomes hopeless. We can try to work out tutoring or coaching to assist you in doing better. If C's are obtained in an additional semester, you will be removed from the program. MARC students must retain a GPA of 3.4 or higher. If you are having trouble in your lab, please see a PI as soon as possible! ☞

## Attending Scientific Conferences

At scientific conferences, scientists meet, network and share their data. Depending on the conference, there may be vendors and publishers promoting their products, or universities advertising their summer research or doctoral programs. At a conference, you will learn an incredible amount about science as a





career, late-breaking findings in your field, and schools that you wish to attend. You will attend presentations made by the top scientists in the U.S. and world. You can make professional contacts that will last throughout your career and attend professional development seminars. All we ask is that you make it worth our while to send you by taking full advantage of these and other opportunities; it's not a vacation, it's a conference. *Do NOT bring or meet friends or family during a conference, as your focus on the conference will suffer.* If you want a holiday, stay longer at the conference and meet people after.

MARC U\*STAR students are funded to present their work at one scientific conference per year and students can attend without presenting (though this is NOT recommended- if you can present, do so!). The first conference that MARC Students will attend is either ABRCMS or SACNAS, and we will go as a group. Please note: All students are encouraged to apply to SACNAS for free travel fellowships; this looks good on a CV and allows our program to send you to an additional meeting.

Please do all of the following as far in advance as you possibly can, so that all paperwork and travel advances can be completed and airfares are as low as possible. *Also, please turn in your receipts (usually for taxis to and from airport and parking fees) within a week of your return.*

**Paperwork:** You must come in and sign travel authorization forms with Linda!

**Registration:** All conferences have a registration fee that the program will pay. Carmen Sepulveda can pre-register you for the conference, if you give her at least a week prior to the conference application deadline. You may also register on site and be reimbursed afterwards, if you keep the receipt for the conference and give it to Linda within a week of your return. This will cost the program more, so we do not recommend it! Please be organized and make your plans early.

**Airfare:** Write down dates and times that you wish to leave and return. Carmen Sepulveda will make your plane reservations. Please do not change your mind about the date after you've given it to her, unless you are willing to pay for the fees associated with ticket changes. If you want to fly with friends, try to turn in all of your time/information to Linda at the same time.

**Hotel:** The MARC U\*STAR program pays for hotel rooms for students attending conferences. If two MBRS or MARC students of the same gender are going to the conference, they MUST room together. If you have a problem rooming with someone, please contact the program staff, privately. Our students might also be paired with students from other programs on the UTSA campus who are also attending.; we can pay, maximally, \$130/student/night for a hotel.

Regarding your choice of hotels; please make reservations early, so that you are not stuck with an amazingly expensive room! Please reserve your room using your own credit card. Then, have the hotel fax us (MARC fax: 210-458-5765) a complete accounting of how much your room will be for that many nights, with taxes included.

Give this to Linda. She will turn in a Travel Advance Voucher for you, that will also include a per diem for the cost of meals in that city where you're staying. This way, you will receive cash to spend before the conference and will not have to pay all of this out of pocket and wait for reimbursement. Note: If you don't give Linda at least 3 weeks notice, your travel advance will likely not be ready by the time you leave and you will have to be reimbursed for everything. Also note- if you don't stay for the whole conference, you will have to pay back this money! Finally, phone calls, in-room snacks, and similar local expenses are not covered by the program.

**Meals:** As mentioned above, the cost of meals will be included in the travel voucher, unless the meals are included in the cost of the conference registration. If you don't get a voucher, you will be reimbursed after the conference. Unless you are at an International meeting (or in Puerto Rico or Hawaii), you will get a flat rate (per diem) for a day's worth of meals. No matter what you eat, you get this much for the day. Each U.S. city has an allowable daily meal cost (per diem), so this amount will vary, usually between 38 and 48 dollars; check with Linda if you want to confirm the amount. As a result of the per diem, you do not have to save receipts for meals and you can actually make money if you don't eat at expensive restaurants.

**Other Travel:** The program will pay for taxi or shuttle fares to and from the hotel/conference center. If the conference is not held at your hotel, then your fees for travel between it and your hotel are covered. Save your receipts and turn them in to Linda within a week of return. The program does NOT pay for personal travel unrelated to the conference- Taxis to theme parks or far off dinners are not reimbursed.

**Student Responsibilities:** We expect students to get more from a conference than a free vacation to a new city. Students should expect to attend lectures and workshops, view posters, check out potential graduate schools and summer programs, and network with other researchers. At each conference attended by Dr. Taylor, Dr. Barea, or other program staff, we will be dining as a group, unless other arrangements are made. Those under age 21 should NOT consume alcoholic beverages and those who provide them will be sent home. Also...please do not put yourself at risk. If you accept rides with hotel staff or other locals, you're not only endangering yourself, but also the careers and emotional health of the staff who are there to supervise you.



**In Summary:** Conferences provide an environment where you can greatly increase your knowledge about science as a career; make personal contacts; and set up summer programs, graduate schools, and post-doctoral experiences. We expect that you will take advantage of these opportunities and further your development as a scientist. ☞

## Program Evaluation

The National Institutes of Health, which runs the MBRS-RISE program is required to justify program effectiveness to the US Congress. To do so, the NIH uses data that we in the local programs provide for them. We continuously examine the effectiveness of program activities and make sure that they are actually benefiting students. We track the progress of our students following graduation and demonstrate that our program is providing a foundation needed for our students to apply for and succeed in doctoral programs. Finally, we must ascertain that our students are actively participating in the program and its ancillary activities, rather than merely “going through the motions.”



To evaluate such things, the programs rely on program staff to collect information on program attendance and sent routine evaluations through SurveyMonkey or Formsite. We also have an external evaluator who crunches our data, examines our progress and success, and assists with annual reports. You will receive an incoming evaluation soon after entering the program, and will see a similar questionnaire when you complete the program, so that we can judge our program impact. Questionnaires or focus groups (sometimes held by our external or “outside” evaluator, who assures data anonymity) will be used throughout the program to obtain feedback about other components, including but not limited to our seminars, scientific meetings, summer research experiences; your comments will be used to make our program better. Your mentor will receive a questionnaire each semester to document your development as a researcher (see next page for a summary of the student evaluation). Finally, over the years, someone from the MARC office will be getting in touch with you to see what you did following receipt of your degree.

What we ask is that you please cooperate with our evaluation efforts. Even if you have something bad to say, say it so that we can improve the program for future students. Please help us by returning the questionnaires quickly so that we may have a full set to compile and analyze.

*Finally...We need your feedback!*

MARC is YOUR program! Although we do not have much control over salaries on a particular grant, we CAN make other improvements. Please let us know what we can do to improve the program. The Program Staff enjoys fixing things and will try to take your suggestions and do constructive things with them (They promise: no oragami). In addition, we are always looking for new components to add to our programs during the next grant cycle. 🍀

## How Am I Doing in the Lab?

As MARC U\*STAR students, you are not taught to be laboratory technicians but rather to take the first steps necessary to be world-class researchers.



*The goals of the “intramural” research component are that you:*

- develop critical reasoning skills required for the development and analysis of scientific ideas.
- learn how to apply laboratory techniques to explore these ideas.
- achieve the confidence, foundation of knowledge, and technical skills necessary to enter and to succeed in graduate school and beyond.
- **Earn a Very Strong Letter of Recommendation from your mentor.**

To receive a positive annual evaluation in the research component of the program, which is vital for you to maintain your status as an MARC participant from year to year, you are expected to make progress towards the goals outlined above. You should work diligently on your research project, successfully balance your academic and research responsibilities, make progress towards graduation, take the steps necessary to enter graduate school, and participate in required MARC-sponsored activities.

Once each semester, your faculty mentor will receive a form to guide them in evaluation of your progress. Questions asked fall into several categories: Intellectual growth and development, research skills and habits, professional career development, and academic progress. We suggest that the faculty also discuss your progress with you at this time.

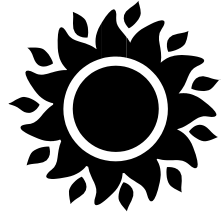
In addition, each semester, you will receive a self-evaluation form, which will allow you to critique your own progress and provide feedback regarding your satisfaction in your laboratory. Please bring up any problems that you may be having...Dr. Taylor will be happy to help you out.

Finally...Drs. Taylor, Barea-Rodriguez and or Cassill will call you into their office about twice per semester to see how your school, research, and planning for the next semester are going. Please set up an appointment with Ayeza promptly after she requests you to do so and fill out and send back any forms that Danielle or Ayeza ask for.

If you'd like to see an evaluation form, to determine what your mentor and the program consider important, we can help you out. All decisions regarding your status will be made through consultation with your mentor and the MBRS-RISE Student Retention and Selection Committee. ☺

## Summer Research Programs!

Summer Undergraduate Research Fellowships are a fantastic opportunity for students to experience the research environment of a larger university or training facility, to meet other faculty and students for networking opportunities, and to learn about graduate school options. As a MARC student, you are required to attend one summer program at a program outside of San Antonio. If you do not attend a summer program, you will forfeit your participation in MARC. Students generally report very positive experiences during these programs. If you know that you wish to go to a particular graduate school, attending their summer research program could be invaluable for you, if you are willing to show them how great an asset you would be! All doctoral programs will positively recognize summer program attendance.



The MARC program PIs have relationships at UT Southwestern, University of Michigan, Stanford University, and Northwestern University; if you want to attend a summer program as your first choice, please let us know! Also, we have friends at Baylor College of Medicine and University of Arizona...again, please notify us.

### **You must notify the programs that select you that you are a MARC trainee!**

The NIH requires that we continue paying you and that the summer program, if federally funded, cannot do so. Please do not allow them to make reservations for you, but rather refer them to Carmen Sepulveda ([carmen.sepulveda@utsa.edu](mailto:carmen.sepulveda@utsa.edu)) so that she can coordinate the finances. We are required to pay for your flight and also provide \$3000 for room and board. Sometimes we reimburse the programs and other times we pay upfront. Between keeping your stipend (\$1000/Mo and the \$3K, you will be making about the same as the other summer program attendees. Talk to Dr. Taylor for additional details.

A non-comprehensive listing of summer programs is available on the MBRS website under Internships at:

<http://www.utsa.edu/mbrs/internships.htm>

Applications for various internships are due from **early January to March 1**. Look up dates and plan accordingly. Each one will need at least two letters of recommendation, preferable from a research mentor and the RISE program director. Ask for these letters well in advance (a month is good...2 weeks is

about minimum), and then “touch base” every so often to make sure that they are written and sent.

The best place to find out about programs is at the ABRCMS or SACNAS conferences or on the MBRS-RISE website. In addition, Dr. Taylor can help you to find programs, and will forward any emails that they happen to obtain from individual programs, to you!

IF YOU FIND THAT YOU ARE NOT BEING ADMITTED TO ANY PROGRAMS LET A PI KNOW ASAP! We can give you strategies for finding a program, and can also sometimes get partner programs to “tack” a funded MARC student onto their program. DO NOT WAIT until it is too late...☞

### *MARC Meetings*

MARC U\*STAR participants will now be meeting periodically with program staff to network with one another, perform team-building tasks, participate in professional development workshops, and to discuss their research progress. You are required to attend these meetings and your attendance will be considered during annual evaluation. These generally run on weeks when we do not have a seminar, starting at 12:00 PM. We will try to make the meetings interesting and informative. If you have any suggestions for meeting topic, please let Drs. Taylor or Barea, know, and we’ll try to schedule it. ☞

### *Award Ceremonies*

At end of the Spring and Fall semesters, the MARC and RISE programs host an awards ceremony to honor our graduates and celebrate the end of the semester. Generally these occur on the Friday prior to study week, over lunchtime. MARC Theses will be presented as oral presentations, beginning around 10:00 AM. These presentations will be followed by lunch. Our graduates will be honored and receive awards. Please make every effort to attend, particularly if YOU are one of those graduating.

These get-togethers are generally supported by the Dean’s office. Students from all levels participate, as well as their mentors. Make sure to network and get to know one another during these events! ☞



## *Additional Training Opportunities – Watch Emails!*

Additional CV-building activities are always available. Look for emails from Dr. Taylor or other program staff to find out more about them. Sometimes they are information about an off-campus training opportunity such as summer programs or funded short courses. Others are about funded “Preview Weekends” where a university flies in underrepresented students to recruit them to their graduate school. Sometimes they involve local mentoring of other students. Others involve conferences for which you can apply for travel awards, or conferences that are happening nearby. There may also be additional leadership training opportunities. Overall...each semester there are many opportunities that come into our will be several of these. Those who take advantage of them are wise. Please keep your eyes open for these opportunities to build your credentials and forward your career. 🐦

## *In Campus Conferences*



During the fall and spring semesters, RISE students at all levels share their research results with one another at the COS Research Conference and the Undergraduate Research and Creative Inquiry Showcase. These are mandatory activities. You can present at this conference with merely a proposal...just get out there and do it! If you have nothing (new student?), you are expected to be there to support the other MARC students and expand your knowledge of various research subjects.

In collaboration with their research mentor, all trainees will create or revise an abstract of their work and submit it online to the meeting organizers. Most students will be selected to give a poster presentation, but we recommend that you volunteer to give an oral in your field for the COS Conference. Be watching for emails advertising these and other presentation activities!

For more information on the COS Conference:

[http://www.utsa.edu/sciences/research\\_conference/](http://www.utsa.edu/sciences/research_conference/)

For more on the Undergraduate Research and Creative Inquiry Showcase:

<http://research.utsa.edu/UGresearch/showcase.php>

Also look for the following conferences on campus:

COEHD Conference

ABES Conference

## MBRS-RISE/MARC-U\*STAR Library

The RISE/MARC programs have developed a professional development library, with books that provide addition depth to various topics discussed in program sponsored courses and meetings. These books may be “checked out” by RISE/MARC students to assist them with developing various skills. Books owned by the library fall into a number of categories, including: Presentation Skills, Grant/Thesis/Essay Writing, Personal Development/Leadership, Scientific Research as a Career, Problem Solving/Critical Thinking, Job/Career Options, Mentoring, Graduate Schools, and Laboratory Skills. We have collected several hundred books! Come see them in the Techlab, BSB 2.03.10!

### ***Favorites include:***

Grants Application Writer’s Handbook  
Schaum’s Outlines on many subjects  
How to Write a Personal Statement  
How to Be an Effective Speaker  
Schaum’s Outlines on many subjects  
Many John Maxwell books  
Great Jobs for Biology Majors!  
At the Bench – A Laboratory Navigator

## Preparation for Doctoral Program Timeline

Although graduation seems far off during your early college years, it’s important to begin preparing early if you plan (or are even considering) to continue on to doctoral education. Finding out late in your final year that you didn’t take the Chem or Stats courses that you need for the top graduate schools throw major roadblocks in your path. The following guidelines were created to help you to chart your course towards successful admission to a doctoral program of your choice.

### ***Freshman/Sophomore Years***

- Take broad science intro courses and labs
- Take courses to help with public speaking and writing
- Get involved in research (MBRS, MARC; volunteer)
- Get to know grad school advisors
- Get to know faculty members for letters

### ***Junior year (or year prior to final year)***

- Take advanced Sciences (Cell, Molec., Micro., Physio., O Chems, Biochem.
- Take liberal arts (econ, history, literature, etc)
- Expand research (Summer Res., Indep Res.)
  - Try to attend at least one summer program





- Choose summer research program at a school of interest
- Begin GRE Prep or MCAT (MD/Ph.D.)
- MCAT should be taken in April of 3<sup>rd</sup> year.
- Take GRE CAT in early Fall Begin gathering information on doctoral programs!
- Assess your focus and desires for a grad program

### **Senior Year (final year)**

- Take advanced courses (research and techniques oriented)
- Apply to at least four programs (M.S., Ph.D., Post-bacc)!
- Request letters of recommendation early!
- Submit Applications on time
  - –Ph.D. – Dec 1 is usually the earliest deadline!
- If possible, visit schools that interest you

### *Summarized from:*

The Leadership Alliance –

Graduate School Guide:

[http://www.theleadershipalliance.org/pdf/grad\\_guide.pdf](http://www.theleadershipalliance.org/pdf/grad_guide.pdf)

Tips on Preparing for and Applying to Graduate School

<http://www.theleadershipalliance.org/pdf/tips.pdf> ↗

## *Finding a Great Graduate School*

Although your research mentor, summer experiences, networking with recruiters at conferences will likely play a strong roll in your choice of graduate school, other online resources are available, as follows:

- Petersons Guide: <http://iiswinprd01.petersons.com/GradChannel/>
- Grad Schools.com: <http://www.gradschools.com>
- Council on Graduate Schools: <http://www.cgsnet.org/>
- Graduate School Guides: <http://www.schoolguides.com/>
- Gradview.com: <http://www.gradview.com/>
- Ph.D.s.org: <http://www.phds.org/>

## *Money Money Money...Money! Obtaining Funding*

Undergraduates who have been accepted for graduate school can also begin putting together a grant. We strongly recommend that you apply for your own, even as an undergraduate! After your first year of grad school, you lose eligibility for several prestigious fellowship! These grants look great on your CV, and give you greater independence in your studies.



*LISTINGS OF GRANTS AND SOURCES FOR DOCTORAL FUNDING*

Online Grant Application Mock review: <http://www.drq.nih.gov/Video/Video.asp>  
Definition of NIH Grant Terms: <http://grants.nih.gov/grants/glossary.htm>  
*Community of Science (Huge database of grants)* <http://www.cos.com/>  
UCLA GRAPES database: <http://www.gdnet.ucla.edu/grpinst.htm>  
Council on Graduate Schools: <http://www.cgsnet.org/Default.aspx?tabid=163>  
GrantsNet: <http://www.grantsnet.org/> Lots of opportunities! Search “pre-doctoral”

NSF list of Grants <http://www.nsf.gov/funding/>

National Academies of Science

<http://www.nationalacademies.org/grantprograms.html>

[http://sites.nationalacademies.org/PGA/FordFellowships/PGA\\_047958](http://sites.nationalacademies.org/PGA/FordFellowships/PGA_047958)

National Institutes of Health:

Kirschstein – Diversity: <http://grants.nih.gov/grants/guide/pa-files/PA-11-112.html>

Kirschstein - General: <http://grants.nih.gov/grants/guide/pa-files/PA-11-111.html>

American Psychological Association: <http://www.apa.org/pi/mfp/index.aspx>

American Physiological Society – <http://www.the-aps.org/education/grad/stuawards.html> 

## Important Career Resource Web Sites

SACNAS: <http://www.sacnas.org> – Many resources

ABRCMS: <http://www.abrcms.org>

JustGarciaHill: <http://www.justgarciahill.org> – Virtual Community for Minority Scientists: jobs, career advice, grants, summer programs.

The Scientist: <http://www.the-scientist.com> – Jobs, etc, for scientists

PhDs.org: <http://www.phds.org> – Career Resources for Scientists

## Hints for Finishing Up and Moving On...



Something that we'd like to stress to students:

You need to take responsibility for your own progress through your degree program and subsequent entry to the “real world”. Have a goal in mind, strengthen your skills required to be successful in that goal, and aggressively pursue it.

*Undergraduates* need to maximize their chance of graduate school admittance. While not neglecting your research, take care to maintain as high a GPA as possible. Particularly, do

not take more courses than you can handle each semester and seek assistance if a subject is proving exceptionally difficult.

**Take charge of your own training/development!**

- Make your own development plan!
- Prepare for Graduate School!
- Prepare for Graduate Fellowships!
- Choose pertinent coursework/ take grad course if possible.
- Maintain a strong GPA (last two years, especially!)
- Seek “Broader Impact” experiences!
- Prepare for the Graduate Record Exam.
- Learn how to write clearly and concisely
- Attend & present at several conferences!
- Try to be an author on abstracts and, better, papers
- Investigate grad schools
- Network network network!
- Complete a Grant! ☞



Notes:

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MARC U\*STAR Research Training Program  
The University of Texas at San Antonio  
Center for Research and Training in the Sciences  
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Booklet by: Gail P. Taylor, Ph.D.  
Some clipart courtesy of the ArtToday web site.